



SURNAME: Strange

FORENAME(S): Sarann
Elizabeth

12 Pages

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
3. The answers must be legibly written. The Examiners can either ignore illegible script or have it typed and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. **Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.**

1	Student Number	1701763
2	Title of Examination Paper	Computer Architecture and Networks
3	Module Code	ACCA4001
4	Date and Time of Examination	10.5.2018
5	Examination Venue	MB103
6	Seat Number	
7	Number of Answer Books handed in	1

List the numbers of the questions you have attempted	Office Use
1	26
2	11
3	20
4	14
	71%
Office Use	

(Gweler yr ochr arall am y fersiwn Cymraeg)



Prysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Cyfarwyddiadau i Ymgeiswyr

12 Tüdalen

1. Rhowch yr holl wybodaeth y gofynnir amdani yn y blychau isod.

2. Rhwch eich enw yn y lle a ddarparwyd ar y dde, plygwch

- et a'i selio i lawr (gan ddefnyddio'r label a ddarparwyd) !

- guddio'ch enw.

3. Rhaid i'r atebion fod mewn llawysgriften ddarllenadwy. Gall yr Arholwyr nall ai anwybyddu sgript annarllenadwy, neu drefnu iddi gael ei theipio a chael yr ymgeisydd i dalu.

4. Ysgriennwch eich atebion mewn inc.

5. Dechreuwch bob ateb ar dudalen newydd. Gwnewch unrhyw fras nodiadau yn y llyfr atebion a thynnu llinell drwyddynt.

6. Ni ddylid rhwgo unrhyw ran o'r llyfr hwn; rhaid ei gyflwyno yn gyfan.

7. Os defnyddir mwy nag un llyfr, rhwymwch hwy gyda'i gilydd gan ddefnyddio'r tagiau sydd ar gael oddi wrth y gwyllywr/gwylwyr.

8. Rhaid dychwelyd pob llyfr. Ni chaniateir mynd â llyfrau atebion, wedi eu defnyddio neu heb eu defnyddio, allan o'r lleoliad arholi o dan unrhyw amgylchiadau.

[illegible]

(See the other side for English version)

Llenwch, plygwch a seliwch (gweler nodyn 2 isod)

CYFENN:

ENW(AU) CYNTAF:

Scrap

Question No.

Examiner Only

		8	4	2	1
0	0	0	0	0	0
1	1	0	0	0	1
2	2	0	0	1	0
3	3	0	0	1	1
4	4	0	1	0	0
5	5	0	1	0	1
6	6	0	1	1	0
7	7	0	1	1	1
8	8	1	0	0	0
9	9	1	0	0	1
10	A	1	0	1	0
11	B	1	0	1	1
12	C	1	1	0	0
13	D	1	1	0	1
14	E	1	1	1	0
15	F	1	1	1	1

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
128	64	32	16	8	4	2	1

Arholwr yn unig

Rhif y Cwestiwn

Question one

a

	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
	128	64	32	16	8	4	2	1
A a)	0	0	1	1	1	0	0	0
b)	1	0	1	0	0	0	1	1
B a)	1	1	1	0	0	1	1	0
b)	0	1	0	1	0	0	1	1

A

B

A

a)

$$\begin{array}{r} 56 \\ - 32 \\ \hline 24 \\ - 16 \\ \hline 8 \\ - 8 \\ \hline 0 \end{array}$$

b)

$$\begin{array}{r} 128 \\ - 128 \\ \hline 35 \\ - 32 \\ \hline 3 \\ - 2 \\ \hline 1 \\ - 1 \\ \hline 0 \end{array}$$

B

a)

$$\begin{array}{r} 128 \\ 64 \\ 32 \\ 4 \\ + 2 \\ \hline 230 \end{array}$$

b)

$$\begin{array}{r} 64 \\ 16 \\ 2 \\ + 1 \\ \hline 83 \end{array}$$

Question one

A

a) $56 = 00111000$

b) $163 = 10100011$

B

a) $11100110 = 230$

b) $01010011 = 83$

C

a) $8B = 10001011$

b) $A7 = 10100111$

①

	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
	128	64	32	16	8	4	2	1
a	0	0	1	0	0	0	1	1
b	1	1	1	0	1	1	1	1

①

a)
$$\begin{array}{r} 32 \\ 2 \\ + 1 \\ \hline 35 \end{array}$$

b)
$$\begin{array}{r} 128 \\ 64 \\ 32 \\ 8 \\ 4 \\ 2 \\ + 1 \\ \hline 239 \\ 12 \end{array}$$

①

a) $23 = 35$ ✓

b) $EF = 239$ ✓

e) 16 ✓

f)
$$\begin{array}{r} 200 \\ \times 800 \\ \hline 000 \\ 0000 \\ 160,000 \end{array}$$

$$\begin{array}{r} 160000 \\ \times 3 \\ \hline 480,000 \end{array}$$
 ✓

$480000 \div 1000$

480 ✓ KB! ✓

g) ?

3 ✓

3 ✓

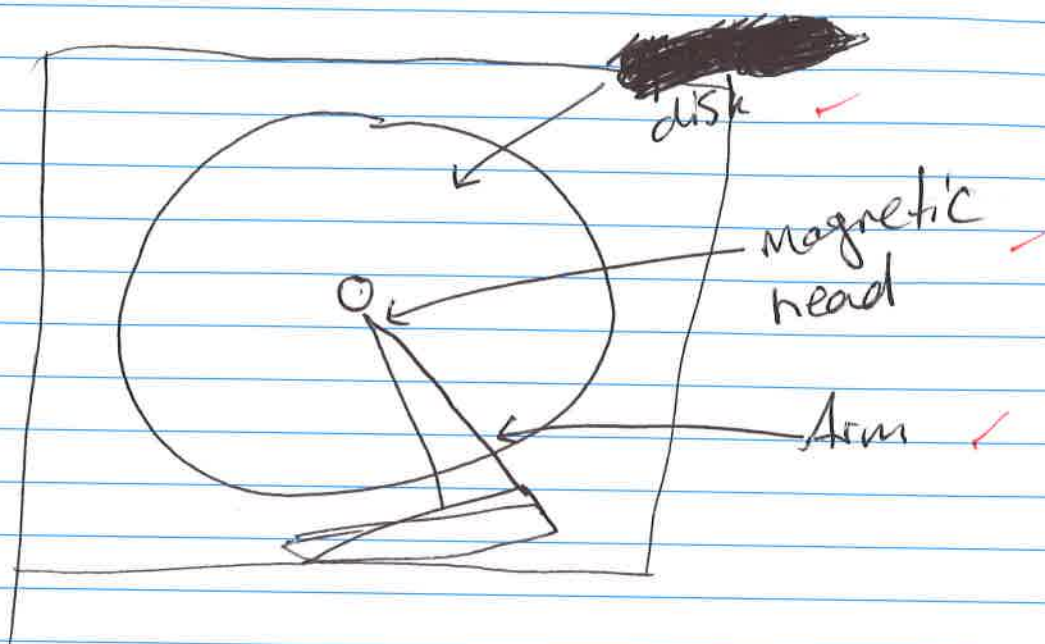
2 ✓

2 ✓

x

Question Two

a



The disk spins at a fast speed while the magnetic head of the arm moves across the disk writing data to the disk as it spins.

Advantages

b) The SSD has a faster read and write speed than the HDD because it doesn't have moving parts.

No moving parts so it is less likely to break down due to physical movement or being knocked over. It is cooler because it doesn't have moving parts.

Disadvantages

It costs more than the HDD. It's got a smaller storage than the HDD.

Question Three

1 Ease of setup

2 ~~frame~~ frame

3 Crossover twisted pair

4 V28

5 200.165.200.215

6 Data

7

8 Selecting the path to destination networks

9) spyware

10 LAN devices

11 Encapsulation

12 Bandwidth; throughput

13 Brute force

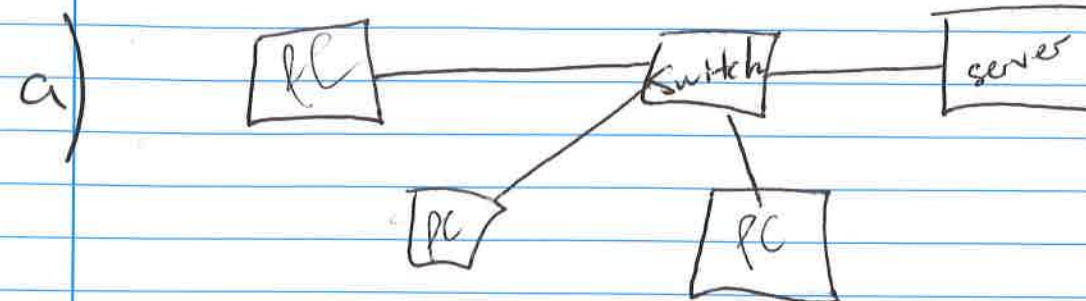
14 TCP

15 Bluetooth

16 ~~10.1.1.1~~ 10.1.1.1

Question No.		Examiner Only	Question No.		Examiner Only
17.	SSH	✓ /	29.	Email	✓ /
18.	UDP	x			
19.	~~FF.FF.FF.FF.FF.FF~~ FF.FF.FF.FF.FF.FF		30.	255.255.255.255	✓ /
20.	DOS	✓ /			(20)
21.	frame	x			
22.	physical Network topology	x			
23.	Multicast	✓ /			
24.	~~default gateway~~ default gateway	x			
25.	Network Interface Card (NIC)	✓ /			
26.	reference model	✓ /			
27.	SMTP	x			
28.	Internet	✓ /			
Arholwr yn unig		Rhify Cwestiwn	Arholwr yn unig		Rhify Cwestiwn

Question 5



* A network is the connection of two or more devices. ~~the~~ devices in a network connection are compatible as communication with each other and other peripherals connected to the network.

b)

Application	✓
Presentation	✓
Session	✓
Transfer	$\frac{1}{2}$
Network	✓
Data	✓
Physical	✓

6 $\frac{1}{2}$

04

128	64	32	16	8	4	2	1
~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
1	0	1	0	1	1	0	0
1	1	0	0	1	0	0	0
0	0	0	0	1	1	1	0
1	1	1	1	1	1	1	0

d) i) 192 . 168 . 26 . 38 → question

$$\begin{array}{r}
 192 \\
 - 128 \\
 \hline
 64 \\
 - 64 = 0 \\
 \hline
 16 \\
 - 16 \\
 \hline
 8 \\
 - 8 \\
 \hline
 0
 \end{array}
 \quad
 \begin{array}{r}
 168 \\
 - 128 \\
 \hline
 32 \\
 - 32 \\
 \hline
 8 \\
 - 8 \\
 \hline
 0
 \end{array}
 \quad
 \begin{array}{r}
 26 \\
 - 16 \\
 \hline
 10 \\
 - 8 \\
 \hline
 2 \\
 - 2 \\
 \hline
 0
 \end{array}
 \quad
 \begin{array}{r}
 38 \\
 - 32 \\
 \hline
 6 \\
 - 4 \\
 \hline
 2 \\
 - 2 \\
 \hline
 0
 \end{array}$$

Answer

$$\therefore = 11000000.10101000.00011010.00100110$$

ii) 172 . 200 . 78 . 254 → question

$$\begin{array}{r}
 172 \\
 - 128 \\
 \hline
 44 \\
 - 32 \\
 \hline
 12 \\
 - 8 \\
 \hline
 4
 \end{array}
 \quad
 \begin{array}{r}
 200 \\
 - 128 \\
 \hline
 72 \\
 - 64 \\
 \hline
 8 \\
 - 8 \\
 \hline
 0
 \end{array}
 \quad
 \begin{array}{r}
 78 \\
 - 64 \\
 \hline
 14 \\
 - 8 \\
 \hline
 6 \\
 - 4 \\
 \hline
 2 \\
 - 2 \\
 \hline
 0
 \end{array}
 \quad
 \begin{array}{r}
 254 \\
 - 128 \\
 \hline
 126 \\
 - 64 \\
 \hline
 62 \\
 - 32 \\
 \hline
 30 \\
 - 16 \\
 \hline
 14 \\
 - 8 \\
 \hline
 6 \\
 - 4 \\
 \hline
 2 \\
 - 2 \\
 \hline
 0
 \end{array}$$

Answer

$$\therefore 10101100.11001000.00001110.11111110$$

$$\therefore \text{question} \quad 255.255.255.240$$

$$\therefore \text{answer} \quad 11111111.11111111.11111111.11110000$$

$$\begin{array}{r}
 240 \\
 - 128 \\
 \hline
 112 \\
 - 64 \\
 \hline
 48 \\
 - 32 \\
 \hline
 16 \\
 - 16 \\
 \hline
 0
 \end{array}$$

	128	64	32	16	8	4	2	1
255 =	1	1	1	1	1	1	1	1
240 =	1	1	1	1	0	0	0	0

$$\begin{array}{r}
 255 \\
 - 128 \\
 \hline
 127 \\
 - 64 \\
 \hline
 63 \\
 - 32 \\
 \hline
 31 \\
 - 16 \\
 \hline
 15 \\
 - 8 \\
 \hline
 7 \\
 - 4 \\
 \hline
 3 \\
 - 2 \\
 \hline
 1
 \end{array}$$

QUESTION TWO (20 marks total)

- a) Produce a labelled diagram showing the construction of a typical rotating hard disk (5 marks)
By referring to this diagram, explain its basic method of operation (5marks)
Similarly, explain what the specifications 'Average access time', 'sustained transfer speed' and 'burst transfer speed' refer to. (3 marks)
- b) How does a Solid State Drive (SSD) differ from a conventional rotating hard disk?
State two advantages and one disadvantage of SSDs over conventional Hard Disks. (7 marks)

QUESTION THREE (30 marks total)

Match each definition/term to appropriate word.

No.	Definition/Terms	Word	Answer
1	An advantage of the peer-to-peer network model is	selecting the path to destination networks	
2	Which term is used to refer to a Layer 2 PDU?	bandwidth, throughput	
3	Which type of Ethernet cable should be used to directly connect two devices that both use the same pins for transmitting and receiving data?	Physical network topology	
4	How many binary bits exist within an IPv6 address?	SSH	
5	An example for global routable IP address	Ease of setup	
6	A centre is a facility used to house computer systems in an enterprise network.	Internet	
7	At which layer of the TCP/IP model does TCP operate?	Network Interface Card (NIC)	
8	What role does a router play on a network?	UDP	
9	What type of program installs and gathers personal information, including password and account information, from a computer without permission or knowledge of the user?	Encapsulation	
10	What type of device is commonly connected to the Ethernet ports on a home wireless router?	TCP	
11	Records where each host is located and how it is connected to the network	default gateway	
12	What terms represent the maximum and actual speed that can be utilized by a device to transfer data?	Frame	

13	Which type of attack involves an attacker using a powerful computer to try a large number of possible passwords in rapid succession to gain access to a system?	200.165.200.215	
14	Which protocol operate at the application layer of the OSI model?	reference model	
15	Transfer a photo to another phone by touching the two devices to each other	multicast	
16	is a private IP address	NFC	
17	provide secured virtual terminal access to remote servers.	HTTP server	
18	Uses acknowledgements to guarantee delivery	data	
19	Which IP configuration parameter provides the IP address of a network device that a computer would use to access the Internet?	email	
20	What type of attack is the ping of death?	TTTTTTTTTTTT	
21	What is a "best effort" protocol well suited for streaming audio and VoIP?		
22	The process of adding additional information to the pieces of data that make up the message in order to ensure that it is delivered to the correct application on the correct destination host	10.1.1.	
23	What type of message is sent to a specific group of hosts?	DoS	
24	is a broadcast Ethernet frame	spyware	
25	Hardware that enables the device to connect to the network medium, either wired or wireless	255.255.255.255	
26	Which type of network model describes the functions that must be completed at a particular layer, but does not specify exactly how each protocol should work?	Crossover twisted-pair	
27	Port 80 is well known port for the server application	Brute force	
28	Term used to describe the global IP network that results from the interconnection of many independently owned networks	LAN devices	
29	What type of server would use IMAP?	128	
30	Which destination IPv4 address does a DHCPv4 client use to send the initial DHCP Discover packet when the client is looking for a DHCP server?	SMTP	